

**ASME B107.2-2002**  
(Revision of ASME B107.2-1995)

# **SOCKET WRENCHES, EXTENSIONS, ADAPTORS, AND UNIVERSAL JOINTS, POWER DRIVE (IMPACT) (INCH SERIES)**

**AN AMERICAN NATIONAL STANDARD**



The American Society of  
Mechanical Engineers



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Mechanical Engineers

A N A M E R I C A N N A T I O N A L S T A N D A R D

# **SOCKET WRENCHES, EXTENSIONS, ADAPTORS, AND UNIVERSAL JOINTS, POWER DRIVE (IMPACT) (INCH SERIES)**

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(Revision of ASME B107.2-1995)

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## FOREWORD

The American National Standards Committee B107, Socket Wrenches and Drives, under sponsorship of The American Society of Mechanical Engineers (ASME), was reorganized as an ASME Standards Committee, and its title was changed to Hand Tools and Accessories.

The purposes of this Standard are to define general and dimensional data specifically applicable to detachable socket wrenches and to specify test methods to evaluate performance relating to the defined requirements.

This Standard is a revision of B107.2-1995 Socket Wrenches, Extensions, Adaptors, and Universal Joints, Power Drive (Impact) (Inch Series). A principal change in this edition of the Standard is the use of Type and Class designations in place of Class and Style designations, in accordance with other B107 Standards. Updated references, finish requirements, and dimensional data are included.

The format of this Standard is in accordance with *The ASME Codes & Standards Writing Guide 2000*. Requests for interpretations of the technical requirements of this Standard should be expressed in writing to the Secretary, B107 Committee, at the address below.

Suggestions for the improvement of this Standard are welcome. They should be addressed to the The American Society of Mechanical Engineers, Secretary, B107 Standards Committee, Three Park Avenue, New York, NY 10016-5990.

The requirements of this Standard become effective at the time of publication. This revision was approved as an American National Standard on May 13, 2002.

# **ASME STANDARDS COMMITTEE B107**

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(The following is the roster of the Committee at the time of approval of this Standard.)

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Secretary, B107 Standards Committee  
The American Society of Mechanical Engineers  
Three Park Avenue  
New York, NY 10016-5990

*Proposing Revisions.* Revisions are made periodically to the Standard to incorporate changes that appear necessary or desirable, as demonstrated by the experience gained from the application of the Standard. Approved revisions will be published periodically.

The Committee welcomes proposals for revisions to this Standard. Such proposals should be as specific as possible, citing the paragraph number(s), the proposed wording, and a detailed description of the reasons for the proposal, including any pertinent documentation.

*Interpretations.* Upon request, the B107 Committee will render an interpretation of any requirement of the Standard. Interpretations can only be rendered in response to a written request sent to the Secretary of the B107 Standards Committee.

The request for interpretation should be clear and unambiguous. It is further recommended that the inquirer submit his/her request in the following format:

Subject:	Cite the applicable paragraph number(s) and the topic of the inquiry.
Edition:	Cite the applicable edition of the Standard for which the interpretation is being requested.
Question:	Phrase the question as a request for an interpretation of a specific requirement suitable for general understanding and use, not as a request for an approval of a proprietary design or situation. The inquirer may also include any plans or drawings, which are necessary to explain the question; however, they should not contain proprietary names or information.

Requests that are not in this format may be rewritten in the appropriate format by the Committee prior to being answered, which may inadvertently change the intent of the original request.

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*Attending Committee Meetings.* The B107 Standards Committee regularly holds meetings, which are open to the public. Persons wishing to attend any meeting should contact the Secretary of the B107 Standards Committee.



# **SOCKET WRENCHES, EXTENSIONS, ADAPTORS, AND UNIVERSAL JOINTS, POWER DRIVE (IMPACT) (INCH SERIES)**

## **1 SCOPE**

This Standard is intended to cover the complete general and dimensional data for detachable socket wrenches, extensions, adaptors, and universal joints for power drive impact use. Inclusion of dimensional data in this Standard is not intended to imply that all of the products described herein are stock production sizes. Consumers are requested to consult with manufacturers concerning lists of stock production sizes.

All dimensions in this Standard are in inches.

## **2 CLASSIFICATION**

**Type I:** Sockets, single (6-point) and double (12-point) hexagon

*Class 1:* Regular length

*Class 2:* Long length

*Class 3:* Extra long length

*Class 4:* Regular length, thin wall

*Class 5:* Long length, thin wall

**Type II:** Sockets, single square (4-point) and double square (8-point)

*Class 1:* Regular length

*Class 2:* Long length

**Type III:** Universal sockets, single hexagon (6-point) and double hexagon (12-point)

*Class 1:* Regular length

*Class 2:* Long length

**Type IV:** Bars, extension

**Type V:** Adaptors

**Type VI:** Universal joint

**Type VII:** Sockets, #5 Spline Drive

*Class 1:* Regular length

*Class 2:* Long length

## **3 NORMATIVE REFERENCES**

The following documents form a part of this Standard to the extent specified herein. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on

this Standard are encouraged to investigate the possibility of applying the most recent edition of the documents indicated below.

ASME B107.4M-1995, Driving and Spindle Ends for Portable Hand, Impact, Air and Electric Tools (percussion tools excluded)

ASME B107.17M-1997, Gages, Wrench Openings, Reference

Publisher: The American Society of Mechanical Engineers (ASME International), Three Park Avenue, New York, NY 10016-5990; Order Department: 22 Law Drive, PO Box 2300, Fairfield, NJ 07007-2300

ASTM E 18-97a, Standard Test Methods for Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials

Publisher: American Society for Testing and Materials (ASTM), 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959

## **4 REQUIREMENTS**

### **4.1 Illustrations**

The illustrations shown herein are descriptive and not restrictive, and are not intended to preclude the manufacture of sockets and attachments that are otherwise in accordance with this Standard.

### **4.2 Materials**

Unless otherwise specified, the material used in the tools shall be steel, the chemical composition and heat treatment of which shall be such as to produce tools conforming to the requirements hereinafter specified.

### **4.3 Dimensions**

Dimensions shall be in accordance with applicable tables.

#### 4.4 Markings

Sockets and attachments shall be marked in a plain and permanent manner with the manufacturer's name or with a trademark of such known character that the source of manufacture and country of origin may be readily determined. In addition, sockets shall be marked in a plain and permanent manner with the nominal size of the wrench opening (distance across flats) for the nut, bolt, or screw end.

#### 4.5 Proof Torque

When tested as specified, sockets and extensions shall withstand the proof torque specified in the applicable tables without failure or permanent deformation (set) that might affect the durability or serviceability of the wrenches.

#### 4.6 Hardness

Sockets and attachments shall be hardened and shall have a hardness value for the various sizes within the range shown in the table below except that the maximum hardness for Type I Class 4 and 5 shall be 52 HRC.

Drive Size, in.	HRC	
	Min.	Max.
$\frac{1}{4}$ , $\frac{3}{8}$	38	55
$\frac{1}{2}$	38	55
$\frac{3}{4}$	38	52
1, #5 Spline	35	50
$1\frac{1}{2}$	35	50
$2\frac{1}{2}$ , $3\frac{1}{2}$	28	42

#### 4.7 Wrench Opening

Wrench opening tolerances shall be such as to ensure acceptance when used with gages conforming to ASME B107.17M.

#### 4.8 Finish

**4.8.1 Surface.** All external surfaces shall be free from pits, nodules, burrs, cracks, and other detrimental defects affecting serviceability.

**4.8.2 Coatings.** The coatings shall be adherent, smooth, continuous, and free from uncoated areas. Sockets and attachments shall have one of the following coatings.

**4.8.2.1 Phosphate Coating.** The coating shall consist of a chemically produced phosphate coating followed with a coating of a rust preventative.

**4.8.2.2 Oxide Coating.** The coating shall consist of a chemically produced oxide coating followed with a coating of a rust preventative.

#### 4.9 Bolt Clearance Hole

A bolt clearance hole shall be provided in all sockets except Type III, universal sockets detailed in para. 4.9.1. The minimum depth of the bolt clearance hole shall be 1.5 times the minimum depth of the nut opening as set forth in the respective tables for regular length sockets and not less than 55% of the overall length for long length and extra long length sockets as measured from the face of the wrench end. The size of the bolt clearance hole shall be in accordance with that of the applicable size socket specified in the respective tables for each class and style.

**4.9.1** A bolt clearance hole may be provided in Type III, Class 1 and 2, universal sockets. The diameter of the hole if provided shall be in accordance with the applicable size socket as specified in Tables 14 and 15.

#### 4.10 Through Hole

A through hole having a minimum diameter equal to 50% of the square drive size or equal to the bolt clearance hole diameter, whichever is smaller, shall be provided.

#### 4.11 Internal Drive Opening

All internal drive openings shall be well defined. The openings shall conform to ASME B107.4M.

#### 4.12 Countersink of Nut End Socket Opening

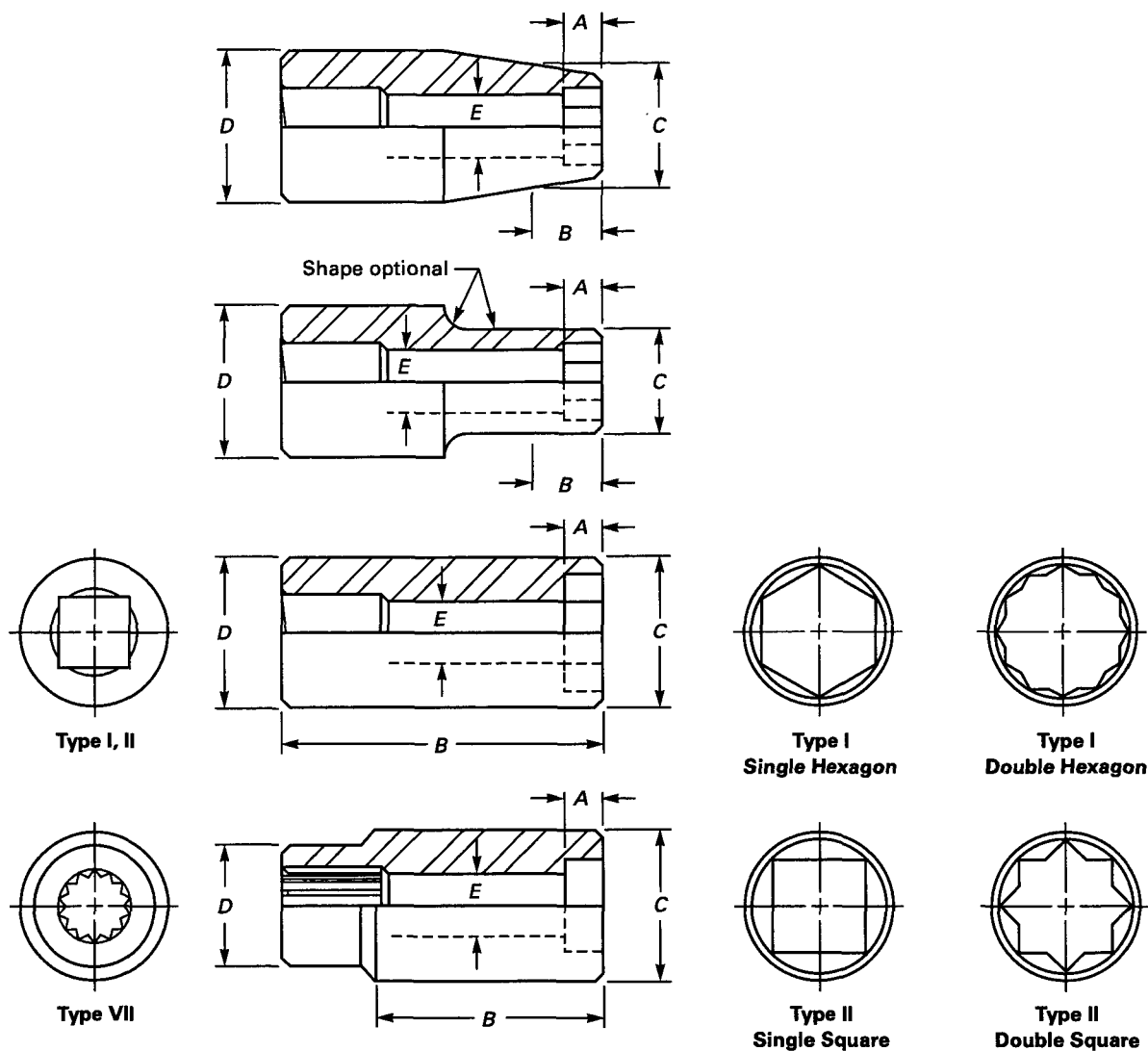
If countersunk, the nut end socket opening shall be countersunk with an included angle of 85 deg to 155 deg and a minimum diameter equal to the across-corners dimension of the opening.

#### 4.13 External Corners

External corners shall be broken with no sharp edges.

#### 4.14 Type I — Socket, Single Hexagon (6-Point) and Double Hexagon (12-Point)

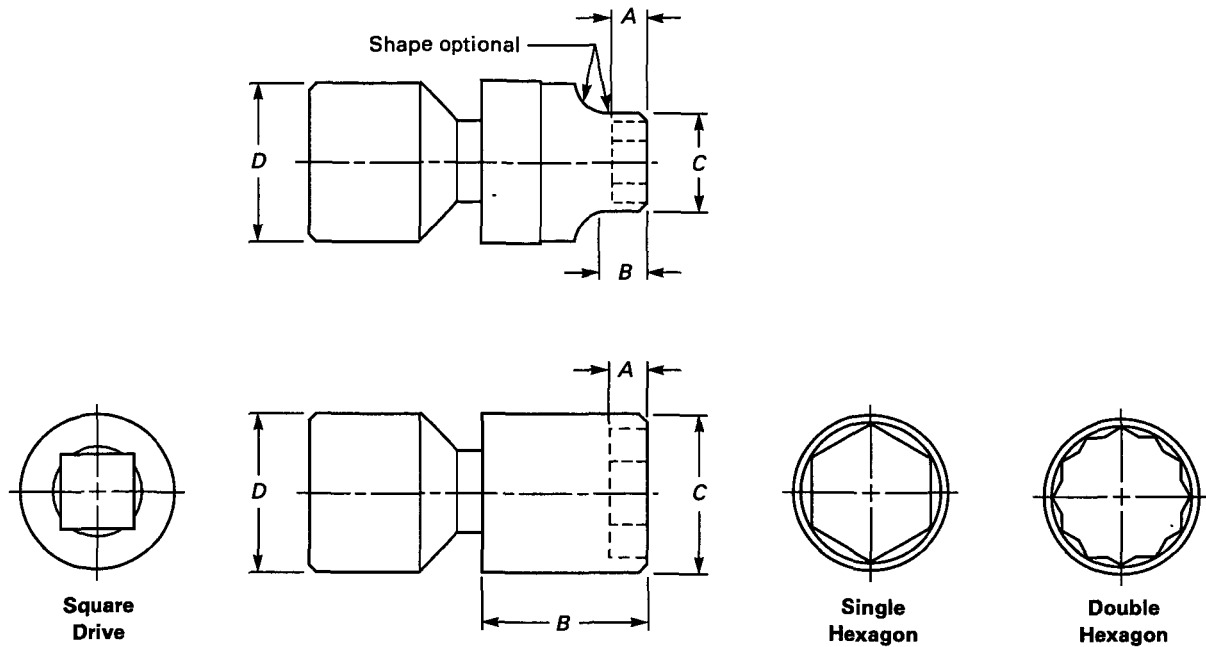
Sockets shall conform to Tables 1 through 7, Table 9, and Table 10.



**GENERAL NOTES:**

- (a)  $A$  shall be equal to or greater than nut opening depth in applicable tables.
- (b) Maximum nut end diameter of socket  $C$  shall not be exceeded for length  $B$  and shall conform to applicable tables.
- (c)  $B$  length shall be greater than or equal to the minimum nut opening depth  $A$  in applicable tables.

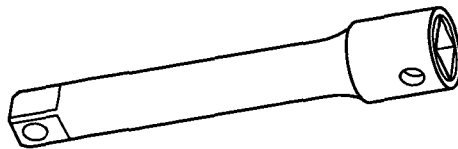
**FIG. 1 TYPE I, II, AND VII SOCKETS, CLASS 1, REGULAR LENGTH;  
CLASS 2, LONG LENGTH**



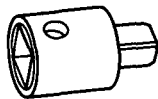
## GENERAL NOTES:

- (a)  $A$  shall be equal to or greater than nut opening depth in applicable tables.
- (b) Maximum nut end diameter of socket  $C$  shall not be exceeded for length  $B$  and shall conform to applicable tables.
- (c)  $B$  length shall be greater than or equal to the minimum nut opening depth  $A$  in applicable tables.
- (d)  $D$  is the outside diameter, drive end, and shall conform to applicable tables.

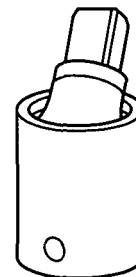
**FIG. 2 TYPE III, UNIVERSAL SOCKETS, SINGLE HEXAGON (6-POINT)  
AND DOUBLE HEXAGON (12-POINT)**



**FIG. 3 TYPE IV, BAR EXTENSION**



**FIG. 4 TYPE V, ADAPTOR**



**FIG. 5 TYPE VI, UNIVERSAL JOINT**

**TABLE 1 TYPE I, CLASS 1 AND 2, SINGLE HEXAGON (6-POINT) AND DOUBLE HEXAGON (12-POINT), REGULAR AND LONG LENGTH,  $\frac{1}{4}$  in. DRIVE**

Nominal Opening, in.	Overall Length, in.		Outside Diameter, in.				Nut Opening Depth, A in., Min.	Bolt Clearance Hole Diameter, E in., Min.	Proof Torque, lbf-in., Min.
			Nut End, C		Drive End, D				
	Regular, Max.	Long, Min.							
			Min.	Max.	Min.	Max.			
3/16	1.010	1.900	0.285	0.320	0.435	0.510	0.110	0.130	95
7/32	1.010	1.900	0.325	0.360	0.435	0.510	0.125	0.130	135
1/4	1.010	1.900	0.360	0.424	0.440	0.510	0.125	0.150	190
9/32	1.010	1.900	0.400	0.490	0.450	0.510	0.125	0.171	250
5/16	1.010	1.900	0.440	0.502	0.470	0.510	0.125	0.171	320
11/32	1.010	1.900	0.475	0.535	0.490	0.535	0.170	0.203	400
3/8	1.010	1.900	0.510	0.580	0.515	0.580	0.219	0.281	500
7/16	1.010	1.900	0.590	0.660	0.550	0.660	0.219	0.281	500
1/2	1.010	1.900	0.665	0.737	0.550	0.730	0.281	0.344	500
9/16	1.010	1.900	0.740	0.815	0.550	0.780	0.281	0.406	500

**TABLE 2 TYPE I, CLASS 1, 2 AND 3, SINGLE HEXAGON (6-POINT) AND DOUBLE HEXAGON (12-POINT), REGULAR, LONG, AND EXTRA LONG LENGTH,  $\frac{3}{8}$  in. DRIVE**

Nominal Opening, in.	Overall Length, in.				Outside Diameter, in.				Nut Opening Depth, A in., Min.	Bolt Clearance Hole Diameter, E in., Min.	Proof Torque, lbf-in., Min.
					Nut End, C		Drive End, D				
	Regular, Max.	Long		Extra Long, Min.							
		Min.	Max.		Min.	Max.					
5/16	1.187	1.688	2.500	...	0.471	0.515	0.677	0.760	0.102	0.171	440
11/32	1.187	1.688	2.500	...	0.490	0.552	0.677	0.760	0.117	0.203	550
3/8	1.187	1.688	2.500	2.688	0.527	0.605	0.677	0.760	0.117	0.281	660
7/16	1.187	1.688	2.500	2.688	0.613	0.697	0.677	0.760	0.203	0.281	930
1/2	1.187	1.688	2.500	2.688	0.693	0.823	0.700	0.823	0.209	0.344	1240
9/16	1.250	1.938	2.750	3.250	0.771	0.885	0.771	0.885	0.249	0.406	1600
5/8	1.250	1.938	2.750	...	0.860	0.948	0.860	0.948	0.281	0.469	2000
11/16	1.250	1.938	2.750	...	0.860	1.031	0.865	1.031	0.318	0.469	2200
3/4	1.250	1.938	2.750	...	1.021	1.073	0.865	1.073	0.356	0.531	2200

#### 4.15 Type II — Sockets, Single Square (4-Point) and Double Square (8-Point)

Sockets shall be similar to Fig. 1 and shall conform to Tables 11, 12, and 13.

#### 4.16 Type III — Universal Sockets, Single Hexagon (6-Point) and Double Hexagon (12-Point) and Type VI — Universal Joints

Universal sockets shall be a single hexagon (6-point) or double hexagon (12-point) as specified. The  $\frac{3}{8}$  in. and  $\frac{1}{2}$  in. drive size universal sockets and universal

joints shall be provided with a friction type tension device which will hold the drive end and socket or tang end in any set position with a force adequate to hold the socket against gravity. The tension device shall compensate for wear. Universal sockets and universal joints shall be capable of rotation in a complete revolution when the angular deviation of one member from the common centerline is 20 deg minimum and 35 deg maximum. Type III universal sockets shall be similar to Fig. 2 and shall conform to Tables 14 and 15 for the size and drive specified. Type VI universal joints shall be similar to Fig. 5 and shall conform to Table 18 for the drive specified.

**TABLE 3 TYPE I, CLASS 1, 2 AND 3, SINGLE HEXAGON (6-POINT) AND DOUBLE HEXAGON (12-POINT), REGULAR, LONG, AND EXTRA LONG LENGTH, 1/2 in. DRIVE**

Nominal Opening, in.	Overall Length, in.				Outside Diameter, in.				Nut Opening Depth, A in., Min.	Bolt Clearance Hole Diameter, E in., Min.	Proof Torque, lbf-in. Min.
	Regular, Max.	Long		Extra Long, Min.	Nut End, C		Drive End, D				
		Min.	Max.		Min.	Max.	Min.	Max.			
3/8	1.800	3.187	3.688	...	0.550	0.715	0.850	1.135	0.117	0.281	1100
7/16	1.800	3.187	3.688	...	0.638	0.806	0.850	1.135	0.203	0.281	1500
1/2	1.800	3.187	3.688	4.938	0.726	0.897	0.850	1.135	0.209	0.344	2000
9/16	1.800	3.187	3.688	4.938	0.814	0.987	0.850	1.135	0.249	0.406	2600
5/8	1.800	3.187	3.688	4.938	0.902	1.070	0.850	1.135	0.281	0.469	3300
11/16	1.800	3.187	3.688	4.938	0.990	1.169	0.990	1.197	0.318	0.469	4100
3/4	1.800	3.187	3.688	4.938	1.062	1.260	1.004	1.260	0.356	0.531	5000
13/16	1.812	3.187	3.688	4.938	1.135	1.325	1.019	1.335	0.418	0.594	5000
7/8	1.960	3.187	3.688	4.938	1.207	1.390	1.033	1.410	0.479	0.594	5000
15/16	2.100	3.187	3.688	4.938	1.280	1.455	1.048	1.485	0.490	0.656	5000
1	2.100	3.187	3.688	4.938	1.352	1.521	1.062	1.560	0.490	0.656	5000
1 1/16	2.410	3.187	3.688	4.938	1.425	1.586	1.077	1.635	0.490	0.687	5000
1 1/8	2.410	3.187	3.688	4.938	1.497	1.651	1.091	1.710	0.632	0.781	5000
1 1/4	2.410	3.187	3.688	...	1.642	1.781	1.120	1.860	0.632	0.812	5000
1 5/16	2.500	3.187	3.688	...	1.789	2.197	1.120	1.906	0.748	0.906	5000
1 3/8	2.500	3.187	3.688	...	1.861	2.197	1.120	1.906	0.748	0.937	5000
1 7/16	2.500	3.187	3.688	...	1.933	2.322	1.120	2.031	0.748	1.000	5000
1 1/2	2.500	3.187	3.688	...	2.005	2.387	1.120	2.156	0.847	1.062	5000
1 9/16	2.500	3.187	3.688	...	2.075	2.445	1.120	2.250	0.847	1.062	5000

**4.17 Type IV — Extension Bars**

Extension bars shall have an external square drive at one end and an internal square drive of the same size at the other end. The extension bar shall be similar to Fig. 3 and shall conform to the dimensions in Table 16.

**4.18 Type V — Adaptors**

Adaptors shall have an external square drive at one end with a different size and an internal square drive at the other end. Adaptors shall be similar to Fig. 4 and shall conform to the dimensions shown in Table 17.

**4.19 Type VII — Sockets, #5 Spline Drive**

Sockets shall be similar to Fig. 1 and shall conform to Table 8.

**5 TEST PROCEDURES****5.1 Hardness**

Conformance to the hardness range specified in para. 4.4 shall be tested on a Rockwell tester, using a diamond

penetrator and employing a 150 kg major load in accordance with ASTM E 18. When surface preparation is necessary, the amount of material removed in the area contacted by the indicator shall not exceed:

Drive Size, in.	Max. Material Removed
1/4, 3/8, 1/2	0.007 in.
3/4	0.015 in.
1, #5 Spline, or larger	0.010 in. per 1 in. of diameter

**5.2 Proof Torque Test**

Socket wrench and drive openings shall be gaged per ASME B107.17M and ASME B107.4M prior to testing and only sockets which are in accordance with the gage shall be tested. They shall be torqued to the proof torque using mandrel depth specified. Following the removal of the proof torque, they shall be regaged. Marking at mandrel contact points is allowable. Any socket which cracks, fractures, or does not gage after torquing shall be considered to have failed the test.

**TABLE 4 TYPE I, CLASS 1 AND 2, SINGLE HEXAGON (6-POINT) AND DOUBLE HEXAGON (12-POINT), REGULAR AND LONG LENGTH,  $\frac{3}{4}$  in. DRIVE**

Nominal Opening, in.	Overall Length, in.		Outside Diameter, in.				Nut Opening Depth, A in., Min.	Bolt Clearance Hole Diameter, E in., Min.	Proof Torque, lbf-in., Min.
			Nut End, C		Drive End, D				
	Regular, Max.	Long, Min.	Min.	Max.	Min.	Max.			
$\frac{9}{16}$	2.125	2.937	0.990	1.010	1.490	1.640	0.249	0.406	3700
$\frac{5}{8}$	2.125	2.937	1.083	1.187	1.490	1.640	0.281	0.469	4400
$\frac{11}{16}$	2.125	2.937	1.146	1.169	1.490	1.640	0.318	0.469	5100
$\frac{3}{4}$	2.125	2.937	1.141	1.268	1.490	1.640	0.356	0.531	6000
$\frac{13}{16}$	2.250	2.937	1.213	1.385	1.490	1.640	0.418	0.594	6800
$\frac{7}{8}$	2.250	2.937	1.285	1.635	1.490	1.640	0.479	0.594	7700
$\frac{15}{16}$	2.375	2.937	1.357	1.635	1.490	1.640	0.490	0.656	8700
1	2.375	2.937	1.429	1.635	1.490	1.715	0.490	0.656	9700
$1\frac{1}{16}$	2.500	2.937	1.501	1.701	1.520	1.790	0.490	0.687	10,800
$1\frac{1}{8}$	2.500	2.937	1.621	1.760	1.550	1.865	0.632	0.781	11,900
$1\frac{1}{4}$	2.625	3.187	1.740	2.197	1.610	2.015	0.632	0.812	14,200
$1\frac{5}{16}$	2.625	3.187	1.796	2.197	1.640	2.090	0.740	0.937	15,400
$1\frac{3}{8}$	2.750	3.187	1.934	2.197	1.670	2.165	0.740	0.937	16,700
$1\frac{7}{16}$	2.750	3.187	1.934	2.322	1.700	2.165	0.740	1.000	18,000
$1\frac{1}{2}$	2.750	3.437	2.052	2.387	1.730	2.165	0.847	1.062	18,000
$1\frac{9}{16}$	2.750	3.437	2.075	2.445	1.730	2.165	0.847	1.062	18,000
$1\frac{5}{8}$	2.750	3.437	2.240	2.510	1.730	2.165	0.847	1.125	18,000
$1\frac{11}{16}$	2.875	3.437	2.490	2.510	1.730	2.165	0.970	1.187	18,000
$1\frac{3}{4}$	2.875	3.437	2.490	2.553	1.730	2.165	0.980	1.187	18,000
$1\frac{13}{16}$	3.062	3.437	2.563	2.631	1.730	2.165	0.990	1.250	18,000
$1\frac{7}{8}$	3.062	3.437	2.600	2.710	1.730	2.165	1.062	1.312	18,000
2	3.250	3.687	2.720	2.867	1.730	2.165	1.062	1.375	18,000
$2\frac{1}{16}$	3.250	3.687	2.800	2.945	1.730	2.165	1.150	1.437	18,000
$2\frac{3}{16}$	3.500	3.937	2.920	3.103	1.730	2.165	1.193	1.500	18,000
$2\frac{1}{4}$	3.500	3.937	3.000	3.181	1.730	2.165	1.276	1.562	18,000
$2\frac{3}{8}$	3.625	4.062	3.120	3.337	1.730	2.165	1.303	1.562	18,000

**5.2.1 Sockets.** A square test plug of suitable strength and complying with the dimensional requirements of the drive tang specified in ASME B107.4M shall be employed. The test plug may be driven by any suitable manual or mechanical means. The socket shall then be engaged on the end of a mandrel to maximum mandrel depth in accordance with Tables 19 and 20. Means shall be provided at the outer end of the test plug to prevent slippage of the socket end-wise from the mandrel and to keep the test pieces in alignment.

**5.2.2 Universal Sockets.** Tests shall be made in the same manner as specified in para. 5.2.1 except that means shall be provided to keep the parts of the

universal socket assembly in the axis about which the load is applied.

**5.2.3 Extension.** Tests shall be made in the same manner as specified in para. 5.2.1 except that the external drive tang shall be inserted in an internal socket and secured in a mandrel.

### 5.3 Mandrels for Wrench Openings

Sockets shall be tested on mandrels. Single hexagon (6-point) or double hexagon (12-point) sockets or universal sockets shall be tested on hexagonal mandrels conforming to Table 19. Single square (4-point) or double square (8-point) sockets shall be tested on square

**TABLE 5 TYPE I, CLASS 4 AND 5, SINGLE HEXAGON (6-POINT) AND DOUBLE HEXAGON (12-POINT), REGULAR AND LONG LENGTH, THIN WALL,  $\frac{1}{2}$  in. DRIVE**

Nominal Opening, in.	Overall Length, in.		Outside Diameter, in.				Nut Opening Depth, A in., Min.	Bolt Clearance Hole Diameter, E in., Min.	Proof Torque, lbf-in., Min.
			Nut End, C		Drive End, D				
	Regular, Max.	Long, Min.	Min.	Max.	Min.	Max.			
$\frac{3}{8}$	2.000	3.187	0.556	0.636	0.850	1.135	0.117	0.281	1100
$\frac{7}{16}$	2.000	3.187	0.633	0.713	0.850	1.135	0.203	0.281	1500
$\frac{1}{2}$	2.000	3.187	0.711	0.791	0.850	1.135	0.209	0.344	2000
$\frac{9}{16}$	2.000	3.187	0.788	0.868	0.850	1.135	0.249	0.406	2600
$\frac{5}{8}$	2.000	3.187	0.866	0.946	0.850	1.135	0.281	0.469	3300
$\frac{11}{16}$	2.000	3.187	0.944	1.024	0.964	1.197	0.318	0.469	4100
$\frac{3}{4}$	2.000	3.187	1.020	1.100	1.004	1.260	0.356	0.531	5000
$\frac{13}{16}$	2.000	3.187	1.098	1.158	1.019	1.335	0.418	0.594	5000
$\frac{7}{8}$	2.000	3.187	1.175	1.255	1.033	1.410	0.479	0.594	5000
$\frac{15}{16}$	2.000	3.187	1.253	1.333	1.048	1.485	0.490	0.656	6000
1	2.500	3.187	1.330	1.410	1.062	1.560	0.490	0.656	5000
$1\frac{1}{16}$	2.500	3.187	1.408	1.488	1.077	1.635	0.490	0.687	5000
$1\frac{1}{8}$	2.500	3.187	1.485	1.565	1.091	1.710	0.632	0.781	5000
$1\frac{3}{16}$	2.500	3.187	1.563	1.643	1.105	1.785	0.632	0.796	5000
$1\frac{1}{4}$	2.500	3.187	1.640	1.720	1.120	1.860	0.632	0.812	5000
$1\frac{5}{16}$	2.500	3.187	1.718	1.798	1.120	1.860	0.748	0.906	5000
$1\frac{3}{8}$	2.500	3.187	1.795	1.875	1.120	1.860	0.748	0.937	5000
$1\frac{7}{16}$	2.500	3.187	1.872	1.952	1.120	2.000	0.748	1.000	5000
$1\frac{1}{2}$	2.500	3.187	1.950	2.030	1.120	2.000	0.847	1.062	5000
$1\frac{9}{16}$	2.500	3.187	2.028	2.108	1.120	2.000	0.847	1.062	5000

mandrels conforming to Table 20. All mandrels shall be hardened to not less than 56 HRC and shall be smoothly finished.

## 6 DESIGNATIONS

Sockets shall be designated by the following data in the sequence shown:

- (a) Power drive (impact) socket
- (b) Drive size

(c) Type

(d) Class

(e) Wrench opening size and configuration (when applicable)

EXAMPLES: Power drive (impact) socket,  $\frac{1}{2}$  in. drive size, Type I, Class 1,  $\frac{3}{4}$  in. opening, single hexagon.

Power drive (impact) socket,  $\frac{3}{4}$  in. drive size, Type I, Class 1,  $1\frac{1}{8}$  in. opening, double hexagon

Power drive (impact) extension bar,  $\frac{3}{4}$  in. drive size, Type IV, 7 in. length



**TABLE 6 TYPE I, CLASS 4, SINGLE HEXAGON (6-POINT) AND DOUBLE HEXAGON  
(12-POINT), REGULAR LENGTH, THIN WALL,  $\frac{3}{4}$  in. DRIVE**

Nominal Opening, in.	Overall Length, in., Max.	Outside Diameter, in.				Nut Opening Depth, A in., Min.	Bolt Clearance Hole Diameter, E in., Min.	Proof Torque, lbf-in., Min.
		Nut End, C		Drive End, D				
		Min.	Max.	Min.	Max.			
1/2	2.125	0.801	0.940	1.490	1.635	0.209	0.344	3000
9/16	2.125	0.990	1.010	1.490	1.635	0.249	0.406	3700
5/8	2.125	1.003	1.187	1.490	1.635	0.281	0.469	4400
11/16	2.125	1.146	1.169	1.490	1.635	0.318	0.469	5100
3/4	2.125	1.141	1.260	1.250	1.640	0.356	0.531	6000
13/16	2.250	1.213	1.385	1.250	1.640	0.418	0.594	6800
7/8	2.250	1.285	1.635	1.275	1.640	0.479	0.594	7700
15/16	2.375	1.357	1.635	1.301	1.640	0.490	0.656	8700
1	2.375	1.429	1.635	1.326	1.715	0.490	0.656	9700
1 1/16	2.500	1.501	1.701	1.351	1.790	0.490	0.687	10,800
1 1/8	2.500	1.573	1.760	1.376	1.865	0.632	0.781	11,900
1 3/16	2.500	1.645	1.980	1.398	1.940	0.632	0.796	13,000
1 1/4	2.625	1.717	2.197	1.427	2.015	0.632	0.812	14,200
1 5/16	2.625	1.789	2.197	1.452	2.090	0.740	0.937	15,400
1 3/8	2.750	1.861	2.197	1.477	2.165	0.740	0.937	16,700
1 7/16	2.750	1.933	2.322	1.503	2.165	0.740	1.000	18,000
1 1/2	2.750	2.005	2.387	1.520	2.165	0.847	1.062	18,000
1 9/16	2.750	2.028	2.180	1.545	2.165	0.847	1.062	18,000
1 5/8	2.750	2.145	2.510	1.578	2.165	0.847	1.125	18,000
1 11/16	2.875	2.245	2.395	1.578	2.165	0.970	1.187	18,000
1 3/4	2.875	2.325	2.475	1.578	2.165	0.980	1.187	18,000
1 13/16	3.062	2.400	2.560	1.578	2.165	0.990	1.250	18,000
1 7/8	3.062	2.490	2.640	1.578	2.165	1.062	1.312	18,000
2	3.250	2.650	2.800	1.578	2.165	1.062	1.375	18,000
2 1/16	3.250	2.730	2.880	1.578	2.165	1.150	1.437	18,000
2 3/16	3.500	2.895	3.050	1.578	2.165	1.193	1.500	18,000
2 1/4	3.500	3.000	3.125	1.578	2.165	1.276	1.562	18,000
2 3/8	3.625	3.140	3.290	1.578	2.165	1.303	1.562	18,000

**TABLE 7 TYPE I, CLASS 1 AND 2, SINGLE HEXAGON (6-POINT) AND DOUBLE HEXAGON (12-POINT), REGULAR AND LONG LENGTH, 1 in. DRIVE**

Nominal Opening, in.	Overall Length, in.		Outside Diameter, in.				Nut Opening Depth, A in., Min.	Bolt Clearance Hole Diameter, E in., Min.	Proof Torque, lbf-in., Min.
			Nut End, C		Drive End, D				
	Regular, Max.	Long, Min.	Min.	Max.	Min.	Max.			
3/4	2.438	2.937	1.281	1.448	1.990	2.135	0.356	0.531	6400
13/16	2.500	2.937	1.365	1.510	1.990	2.135	0.418	0.594	7400
7/8	2.500	2.937	1.417	1.544	1.990	2.135	0.479	0.594	8400
15/16	2.563	2.937	1.480	1.607	1.990	2.135	0.490	0.656	9400
1	2.563	2.937	1.490	1.763	1.990	2.135	0.490	0.656	10,500
1 1/16	2.687	2.937	1.521	1.763	1.990	2.197	0.490	0.687	11,700
1 1/8	2.687	2.937	1.552	1.823	1.990	2.197	0.632	0.781	12,800
1 3/16	2.750	2.937	1.680	1.980	1.990	2.197	0.632	0.796	14,100
1 1/4	2.750	2.937	1.736	2.197	1.990	2.197	0.632	0.812	15,400
1 5/16	2.875	3.187	1.828	2.260	1.990	2.197	0.740	0.937	16,700
1 3/8	2.938	3.187	1.920	2.322	1.990	2.322	0.740	0.937	18,000
1 7/16	2.938	3.187	2.012	2.397	1.990	2.397	0.740	1.000	19,500
1 1/2	3.000	3.437	2.104	2.473	1.990	2.473	0.847	1.062	21,000
1 9/16	3.063	3.437	2.196	2.548	1.990	2.548	0.847	1.062	22,000
1 5/8	3.063	3.437	2.288	2.623	1.990	2.623	0.847	1.125	24,000
1 11/16	3.250	3.437	2.379	2.699	1.990	2.699	0.970	1.187	26,000
1 3/4	3.250	3.437	2.471	2.774	1.990	2.774	0.980	1.187	27,000
1 13/16	3.250	3.437	2.563	2.849	2.240	2.849	0.990	1.250	28,000
1 7/8	3.250	3.437	2.655	2.925	2.240	2.925	1.062	1.312	28,000
1 15/16	3.375	3.625	2.747	3.000	2.240	3.000	1.062	1.375	28,000
2	3.438	3.687	2.839	3.073	2.240	3.073	1.062	1.375	28,000
2 1/16	3.600	3.687	2.931	3.073	2.240	3.073	1.169	1.437	28,000
2 1/8	3.563	3.937	3.023	3.166	2.240	3.166	1.169	1.500	28,000
2 3/16	3.563	3.937	3.115	3.260	2.365	3.260	1.193	1.500	28,000
2 1/4	3.625	3.937	3.240	3.385	2.365	3.385	1.276	1.562	28,000
2 5/16	3.688	4.000	3.302	3.447	2.365	3.447	1.276	1.562	28,000
2 3/8	3.760	4.062	3.365	3.510	2.365	3.510	1.303	1.562	28,000
2 7/16	3.875	4.325	3.490	3.640	2.365	3.640	1.353	1.687	28,000
2 1/2	3.937	4.325	3.490	3.640	2.365	3.640	1.353	1.750	28,000
2 9/16	4.000	4.325	3.615	3.760	2.365	3.760	1.380	1.750	28,000
2 5/8	4.000	4.625	3.615	3.760	2.365	3.760	1.460	1.812	28,000
2 11/16	4.125	4.625	3.677	3.885	2.365	3.885	1.460	1.875	28,000
2 3/4	4.250	4.625	3.740	4.010	2.365	4.010	1.490	1.875	28,000
2 13/16	4.375	4.812	3.990	4.100	2.365	4.100	1.567	1.937	28,000
2 7/8	4.500	4.812	3.990	4.072	2.365	4.072	1.567	1.937	28,000
2 15/16	4.625	4.812	3.990	4.135	2.365	4.135	1.600	1.937	28,000
3	4.625	5.062	4.115	4.260	2.365	4.260	1.675	2.125	28,000
3 1/8	4.750	5.062	4.115	4.385	2.365	4.385	1.708	2.125	28,000
3 1/4	4.750	5.250	4.180	4.572	2.365	4.572	1.708	2.312	28,000
3 3/8	4.750	5.437	4.240	4.760	2.365	4.760	1.870	2.375	28,000
3 1/2	5.375	5.437	4.740	5.040	2.365	5.040	1.911	2.375	28,000
3 5/8	5.375	5.437	4.750	5.050	2.365	5.050	2.000	2.560	28,000
3 7/8	5.375	5.437	4.900	5.365	2.365	5.365	2.150	2.625	28,000
4	5.750	6.000	5.120	5.520	2.365	5.520	2.200	2.850	28,000
4 1/8	5.750	6.000	5.300	5.680	2.365	5.680	2.250	2.850	28,000
4 1/4	5.750	6.000	5.400	5.835	2.365	5.835	2.300	2.850	28,000
4 1/2	6.000	6.000	5.600	6.150	2.365	6.150	2.400	3.090	28,000

**TABLE 8 TYPE VII, CLASS 1 AND 2, SINGLE HEXAGON (6-POINT) AND DOUBLE HEXAGON (12-POINT), REGULAR AND LONG LENGTH, #5 SPLINE DRIVE**

Nominal Opening, in.	Overall Length, in.		Outside Diameter, in.				Nut Opening Depth, A in., Min.	Bolt Clearance Hole Diameter, E in., Min.	Proof Torque, lbf-in., Min.
			Nut End, C		Drive End, D				
	Regular, Max.	Long, Min.	Min.	Max.	Min.	Max.			
3/4	2.438	2.937	1.281	1.448	2.365	2.406	0.356	0.531	6400
13/16	2.500	2.937	1.365	1.510	2.365	2.406	0.418	0.594	7400
7/8	2.500	2.937	1.417	1.544	2.365	2.406	0.479	0.594	8400
15/16	2.563	2.937	1.480	1.607	2.365	2.406	0.490	0.656	9400
1	2.563	2.937	1.490	1.763	2.365	2.406	0.490	0.656	10,500
1 1/16	2.687	2.937	1.521	1.763	2.365	2.406	0.490	0.687	11,700
1 1/8	2.687	2.937	1.552	1.823	2.365	2.406	0.632	0.781	12,800
1 1/4	2.750	2.937	1.736	2.197	2.365	2.406	0.632	0.812	15,400
1 5/16	2.875	3.187	1.828	2.380	2.365	2.406	0.740	0.937	16,700
1 3/8	2.938	3.187	1.920	2.380	2.365	2.406	0.740	0.937	18,000
1 7/16	2.938	3.187	2.012	2.397	2.365	2.406	0.740	1.000	19,500
1 1/2	3.000	3.437	2.104	2.473	2.365	2.473	0.847	1.062	21,000
1 5/8	3.063	3.437	2.288	2.623	2.365	2.510	0.847	1.125	24,000
1 11/16	3.250	3.437	2.379	2.699	2.365	2.635	0.970	1.187	26,000
1 13/16	3.250	3.437	2.563	2.849	2.365	2.822	0.990	1.250	29,000
1 7/8	3.250	3.437	2.655	2.925	2.365	2.822	1.062	1.312	31,000
2	3.438	3.687	2.839	3.073	2.365	3.073	1.062	1.375	34,000
2 1/16	3.500	3.687	2.931	3.073	2.365	3.073	1.169	1.437	36,000
2 3/16	3.563	3.937	3.115	3.260	2.365	3.260	1.193	1.500	40,000
2 1/4	3.625	3.937	3.240	3.385	2.365	3.260	1.276	1.562	42,000
2 3/8	3.750	4.062	3.365	3.510	2.365	3.385	1.303	1.562	46,000
2 7/16	3.875	4.325	3.490	3.510	2.365	3.510	1.353	1.687	48,000
2 1/2	3.937	4.325	3.490	3.510	2.365	3.510	1.353	1.750	48,000
2 9/16	4.000	4.325	3.615	3.760	2.365	3.635	1.380	1.750	48,000
2 5/8	4.000	4.625	3.615	3.760	2.365	3.760	1.460	1.812	48,000
2 3/4	4.250	4.625	3.740	4.010	2.365	4.010	1.490	1.875	48,000
2 13/16	4.375	4.812	3.990	4.010	2.365	4.135	1.567	1.937	48,000
2 15/16	4.625	4.812	3.990	4.135	2.365	4.135	1.600	1.937	48,000
3	4.625	5.062	4.115	4.260	2.365	4.260	1.675	2.125	48,000
3 1/8	4.750	5.062	4.115	4.385	2.365	4.260	1.708	2.125	48,000
3 3/8	4.750	5.437	4.240	4.760	2.365	4.635	1.870	2.375	48,000
3 1/2	5.375	5.437	4.740	4.760	2.365	4.760	1.911	2.375	48,000

**TABLE 9 TYPE I, CLASS 1 AND 2, SINGLE HEXAGON (6-POINT) AND DOUBLE HEXAGON  
(12-POINT), REGULAR AND LONG LENGTH, 1½ in. DRIVE**

Nominal Opening, in.	Overall Length, in.		Outside Diameter, in.				Nut Opening Depth, A in., Min.	Bolt Clearance Hole Diameter, E in., Min.
			Nut End, C		Drive End, D			
	Regular, Max.	Long, Min.	Min.	Max.	Min.	Max.		
1 <sup>3</sup> / <sub>8</sub>	3.250	4.000	2.490	2.885	2.990	3.260	0.750	0.937
1 <sup>7</sup> / <sub>16</sub>	3.250	4.000	2.490	2.885	2.990	3.260	0.875	1.000
1 <sup>1</sup> / <sub>2</sub>	3.250	4.000	2.553	2.915	2.990	3.260	0.931	1.062
1 <sup>9</sup> / <sub>16</sub>	3.250	4.000	2.553	2.915	2.990	3.260	1.000	1.093
1 <sup>5</sup> / <sub>8</sub>	3.250	4.000	2.615	3.041	2.990	3.260	1.063	1.125
1 <sup>11</sup> / <sub>16</sub>	3.250	4.000	2.740	3.041	2.990	3.260	1.063	1.187
1 <sup>3</sup> / <sub>4</sub>	3.375	4.250	2.740	3.135	2.990	3.260	1.109	1.187
1 <sup>13</sup> / <sub>16</sub>	3.375	4.250	2.865	3.135	2.990	3.260	1.140	1.250
1 <sup>7</sup> / <sub>8</sub>	3.656	4.375	2.921	3.198	2.990	3.260	1.181	1.312
1 <sup>15</sup> / <sub>16</sub>	3.656	4.375	2.990	3.260	2.990	3.260	1.218	1.312
2	3.812	4.500	3.178	3.573	3.240	3.573	1.250	1.375
2 <sup>1</sup> / <sub>16</sub>	3.812	4.500	3.183	3.635	3.240	3.635	1.296	1.437
2 <sup>1</sup> / <sub>8</sub>	3.938	4.750	3.183	3.635	3.240	3.635	1.343	1.469
2 <sup>3</sup> / <sub>16</sub>	3.938	4.750	3.240	3.698	3.240	3.698	1.375	1.500
2 <sup>1</sup> / <sub>4</sub>	4.125	5.000	3.365	3.822	3.240	3.822	1.406	1.562
2 <sup>5</sup> / <sub>16</sub>	4.125	5.000	3.365	3.822	3.240	3.822	1.456	1.562
2 <sup>3</sup> / <sub>8</sub>	4.188	5.000	3.490	3.885	3.240	3.885	1.500	1.562
2 <sup>7</sup> / <sub>16</sub>	4.188	5.000	3.615	3.941	3.240	3.941	1.551	1.687
2 <sup>1</sup> / <sub>2</sub>	4.188	5.000	3.678	4.073	3.240	4.073	1.578	1.750
2 <sup>9</sup> / <sub>16</sub>	4.188	5.000	3.740	4.103	3.240	4.103	1.609	1.750
2 <sup>5</sup> / <sub>8</sub>	4.312	5.125	3.865	4.198	3.240	4.198	1.656	1.812
2 <sup>11</sup> / <sub>16</sub>	4.312	5.125	3.925	4.260	3.240	4.260	1.688	1.844
2 <sup>3</sup> / <sub>4</sub>	4.500	5.250	4.053	4.385	3.240	4.385	1.750	1.875
2 <sup>13</sup> / <sub>16</sub>	4.500	5.250	4.115	4.573	3.240	4.573	1.781	1.937
2 <sup>7</sup> / <sub>8</sub>	4.625	5.375	4.178	4.635	3.240	4.635	1.812	1.937
2 <sup>15</sup> / <sub>16</sub>	4.625	5.375	4.178	4.698	3.240	4.698	1.843	1.937
3	4.800	5.625	4.365	4.835	3.240	4.835	1.890	2.125
3 <sup>1</sup> / <sub>16</sub>	4.800	5.625	4.490	4.885	3.240	4.885	1.931	2.125
3 <sup>1</sup> / <sub>8</sub>	4.800	5.625	4.553	4.941	3.240	4.941	2.000	2.125
3 <sup>3</sup> / <sub>16</sub>	4.800	5.625	4.615	5.010	3.240	5.010	2.000	2.187
3 <sup>1</sup> / <sub>4</sub>	5.063	5.750	4.678	5.073	3.240	5.073	2.045	2.249
3 <sup>5</sup> / <sub>16</sub>	5.063	5.750	4.740	5.135	3.240	5.135	2.093	2.311
3 <sup>3</sup> / <sub>8</sub>	5.063	5.750	4.865	5.135	3.240	5.135	2.125	2.375
3 <sup>7</sup> / <sub>16</sub>	5.063	5.750	4.865	5.198	3.240	5.198	2.156	2.375
3 <sup>1</sup> / <sub>2</sub>	5.188	5.875	4.865	5.260	3.240	5.260	2.250	2.375
3 <sup>9</sup> / <sub>16</sub>	5.188	5.875	4.920	5.322	3.240	5.322	2.250	2.387
3 <sup>5</sup> / <sub>8</sub>	5.312	6.125	4.990	5.385	3.240	5.385	2.281	2.399
3 <sup>11</sup> / <sub>16</sub>	5.312	6.125	4.990	5.448	3.240	5.448	2.328	2.405
3 <sup>3</sup> / <sub>4</sub>	5.625	6.500	5.115	5.573	3.240	5.573	2.375	2.411
3 <sup>13</sup> / <sub>16</sub>	5.625	6.500	5.240	5.635	3.240	5.635	2.406	2.423
3 <sup>7</sup> / <sub>8</sub>	5.750	6.750	5.302	5.698	3.240	5.698	2.500	2.435
3 <sup>15</sup> / <sub>16</sub>	5.875	6.875	5.490	5.822	3.240	5.822	2.500	2.447
4	5.875	6.875	5.490	5.885	3.240	5.885	2.500	2.459
4 <sup>1</sup> / <sub>16</sub>	5.875	6.875	5.553	5.941	3.240	5.941	2.593	2.471

**TABLE 9 TYPE I, CLASS 1 AND 2, SINGLE HEXAGON (6-POINT) AND DOUBLE HEXAGON (12-POINT), REGULAR AND LONG LENGTH, 1½ in. DRIVE (CONT'D)**

Nominal Opening, in.	Outside Diameter, in.						Nut Opening Depth, <b>A</b> in., Min.	Bolt Clearance Hole Diameter, <b>E</b> in., Min.
	Overall Length, in.		Nut End, <b>C</b>		Drive End, <b>D</b>			
	Regular, Max.	Long, Min.	Min.	Max.	Min.	Max.		
4 <sup>1</sup> / <sub>8</sub>	6.063	7.000	5.740	6.073	3.240	6.073	2.593	2.483
4 <sup>3</sup> / <sub>16</sub>	6.063	7.000	5.740	6.103	3.240	6.103	2.625	2.495
4 <sup>1</sup> / <sub>4</sub>	6.063	7.000	5.802	6.135	3.240	6.135	2.750	2.507
4 <sup>5</sup> / <sub>16</sub>	6.375	7.375	5.865	6.322	3.240	6.322	2.750	2.519
4 <sup>3</sup> / <sub>8</sub>	6.375	7.375	5.921	6.322	3.240	6.322	2.750	2.531
4 <sup>7</sup> / <sub>16</sub>	6.375	7.375	5.990	6.395	3.240	6.395	2.796	2.543
4 <sup>1</sup> / <sub>2</sub>	6.625	7.625	6.115	6.573	3.240	6.573	2.835	2.555
4 <sup>5</sup> / <sub>8</sub>	6.625	7.625	6.302	6.573	3.240	6.573	3.000	2.567
4 <sup>3</sup> / <sub>4</sub>	6.625	7.625	6.365	6.635	3.240	6.635	3.000	2.580

**TABLE 10 TYPE I, CLASS 1, SINGLE HEXAGON (6-POINT), REGULAR LENGTH, 2½ in. DRIVE**

Nominal Opening, in.	Overall Length, in., Regular, Max.	Outside Diameter, in.		Nut Opening Depth, A in., Min.	Bolt Clearance Hole Diameter, E in., Min.
		Nut End, C	Drive End, D		
		Max.	Max.		
2¼	5.500	4.313	5.500	1.276	1.562
2⅜	5.500	4.313	5.500	1.303	1.562
2⅞	5.500	4.313	5.500	1.353	1.687
2⅞	5.500	4.313	5.500	1.380	1.750
2⅞	5.500	4.313	5.500	1.460	1.812
2¾	5.750	5.000	5.500	1.490	1.875
2⅞	5.750	5.000	5.750	1.567	1.937
2⅞	5.750	5.000	5.750	1.600	1.937
3	5.750	5.000	5.750	1.675	2.125
3⅞	5.750	5.000	5.750	1.708	2.125
3⅞	5.750	5.500	5.750	1.870	2.375
3½	5.750	5.500	5.750	1.911	2.375
3¾	6.250	6.250	6.000	1.913	2.375
3⅞	6.250	6.250	6.000	2.125	2.625
4⅞	6.250	6.250	6.000	2.125	2.625
4¼	6.750	7.000	6.000	2.338	2.875
4½	7.000	7.000	6.000	2.338	2.875
4⅞	7.000	7.000	6.000	2.550	3.125
5	7.500	7.500	6.000	2.763	3.375
5¾	7.750	8.625	6.000	3.188	3.875
6⅞	8.000	9.000	6.000	3.400	4.125

**TABLE 11 TYPE II, CLASS 1 AND 2, SINGLE SQUARE (4-POINT) AND DOUBLE SQUARE (8-POINT), REGULAR AND LONG LENGTH SOCKETS,  $\frac{3}{8}$  in. DRIVE**

Nominal Opening, in.	Overall Length, in.			Outside Diameter, in.				Nut Opening Depth, A in., Min.	Bolt Clearance Hole Diameter, E in., Min.	Proof Torque, lbf-in., Min.
	8 Point		4 Point	Nut End, C		Drive End, D				
	Regular, Max.	Long, Min.	Regular, Max.							
				Min.	Max.	Min.	Max.			
$\frac{1}{4}$	1.000	1.437	1.000	0.466	0.491	0.677	0.697	0.087	0.156	270
$\frac{5}{16}$	1.000	1.437	1.000	0.559	0.666	0.677	0.760	0.102	0.171	440
$\frac{3}{8}$	1.000	1.437	1.000	0.637	0.760	0.677	0.760	0.117	0.281	660
$\frac{7}{16}$	1.063	1.437	...	0.740	0.854	0.740	0.854	0.203	0.281	930
$\frac{1}{2}$	1.063	1.562	...	0.865	0.948	0.865	0.948	0.209	0.343	1240
$\frac{9}{16}$	1.140	1.562	...	0.950	1.041	0.950	1.041	0.249	0.406	1600
$\frac{5}{8}$	1.290	...	...	1.052	1.138	1.052	1.138	0.281	0.469	2000
$\frac{11}{16}$	1.290	...	...	1.115	1.198	1.115	1.198	0.318	0.469	2200

**TABLE 12 TYPE II, CLASS 1 AND 2, SINGLE SQUARE (4-POINT) AND DOUBLE SQUARE (8-POINT), REGULAR AND LONG LENGTH,  $\frac{1}{2}$  in. DRIVE**

Nominal Opening, in.	Overall Length, in.			Outside Diameter, in.				Nut Opening Depth, A in., Min.	Bolt Clearance Hole Diameter, E in., Min.	Proof Torque, lbf-in., Min.
	8-Point		4-Point	Nut End, C		Drive End, D				
	Regular, Max.	Long, Min.	Long, Min.	Min.	Max.	Min.	Max.			
$\frac{3}{8}$	1.800	3.187	3.187	0.697	0.760	0.865	1.010	0.117	0.281	1100
$\frac{7}{16}$	1.800	3.187	3.187	0.802	0.860	0.927	1.010	0.203	0.281	1500
$\frac{1}{2}$	1.800	3.187	3.187	0.898	0.978	0.927	1.041	0.209	0.344	2000
$\frac{9}{16}$	1.800	3.187	3.187	0.990	1.041	0.990	1.138	0.249	0.406	2600
$\frac{5}{8}$	1.800	3.187	...	1.099	1.166	1.104	1.197	0.281	0.469	3300
$\frac{11}{16}$	1.800	3.187	...	1.178	1.260	1.178	1.260	0.318	0.469	4100
$\frac{3}{4}$	1.800	3.187	...	1.302	1.343	1.115	1.385	0.356	0.531	5000
$\frac{13}{16}$	1.800	3.187	...	1.365	1.447	1.115	1.447	0.418	0.594	5000
$\frac{7}{8}$	1.800	3.187	...	1.490	1.573	1.245	1.572	0.479	0.594	5000
$\frac{15}{16}$	2.100	3.437	...	1.601	1.666	1.302	1.697	0.490	0.656	5000
1	2.100	3.437	...	1.678	1.760	1.302	1.760	0.490	0.656	5000
$1\frac{1}{16}$	2.100	...	...	1.823	1.843	1.823	1.843	0.490	0.687	5000

**TABLE 13 TYPE II, CLASS 1 AND 2, SINGLE SQUARE (4-POINT) AND DOUBLE SQUARE (8-POINT),  
REGULAR AND LONG LENGTH,  $\frac{3}{4}$  in. DRIVE**

Nominal Opening, in.	Overall Length, in.				Outside Diameter, in.				Nut Opening Depth, A in., Min.	Bolt Clearance Hole Diameter, E in., Min.	Proof Torque, lbf-in., Min.
	8-Point		4-Point		Nut End, C		Drive End, D				
	Regular, Max.	Long, Min.	Regular, Max.	Long, Min.							
					Min.	Max.	Min.	Max.			
1/2	2.250	2.937	2.250	2.937	0.990	1.073	1.490	1.635	0.209	0.344	2000
9/16	2.250	2.937	2.250	2.937	1.146	1.166	1.490	1.635	0.249	0.406	2600
5/8	2.250	2.937	2.250	2.937	1.240	1.260	1.490	1.635	0.281	0.469	3300
11/16	2.250	2.937	2.250	2.937	1.333	1.354	1.490	1.635	0.318	0.469	4100
3/4	2.313	2.937	2.313	2.937	1.490	1.635	1.490	1.635	0.356	0.531	5000
13/16	2.438	2.937	2.438	2.937	1.615	1.698	1.615	1.760	0.418	0.594	5000
7/8	2.438	2.937	...	...	1.740	1.760	1.615	1.826	0.479	0.594	5000
15/16	2.438	2.937	...	...	1.802	1.826	1.615	1.826	0.490	0.656	5000
1	2.594	2.937	...	...	1.927	2.135	1.615	2.135	0.490	0.656	5000
1 1/16	2.594	2.937	...	...	1.990	2.135	1.740	2.135	0.490	0.687	5000
1 1/8	2.750	2.937	...	...	2.115	2.322	1.740	2.322	0.632	0.781	5000
1 1/4	2.750	2.937	...	...	2.365	2.447	1.740	2.447	0.632	0.812	5000
1 5/16	2.750	2.937	...	...	2.490	2.697	1.740	2.697	0.740	0.937	5000
1 7/16	2.750	...	...	...	2.615	2.697	1.740	2.697	0.740	1.000	5000
1 1/2	2.750	...	...	...	2.740	2.823	1.740	2.823	0.847	1.062	5000

**TABLE 14 TYPE III, CLASS 1 AND 2, UNIVERSAL, SINGLE HEXAGON (6-POINT) AND DOUBLE  
HEXAGON (12-POINT), REGULAR AND LONG LENGTH,  $\frac{3}{8}$  in. DRIVE**

Nominal Opening, in.	Overall Length, in.		Outside Diameter, in.				Nut Opening Depth, A in., Min.	Bolt Clearance Hole Diameter, E in., Min.	Depth of Bolt Clearance Hole, in., Min.	Proof Torque, lbf-in., Min.
			Nut End, C		Drive End, D					
	Regular, Max.	Long, Min.								
			Min.	Max.	Min.	Max.				
3/8	2.500	2.750	0.520	0.760	0.677	0.910	0.117	0.281	0.937	450
7/16	2.500	2.750	0.607	0.760	0.677	0.910	0.203	0.281	0.937	625
1/2	2.500	2.750	0.677	0.823	0.677	0.910	0.209	0.344	0.937	725
9/16	2.500	2.750	0.740	0.850	0.677	0.910	0.249	0.406	0.937	750
5/8	2.500	2.750	0.855	0.948	0.730	0.910	0.281	0.469	0.937	750
1 1/16	2.650	3.250	0.970	1.010	0.730	0.910	0.318	0.469	0.937	750
3/4	2.650	3.250	1.030	1.135	0.730	0.910	0.356	0.531	0.937	750

**TABLE 15 TYPE III, CLASS 1 AND 2, UNIVERSAL, SINGLE HEXAGON (6-POINT) AND DOUBLE  
HEXAGON (12-POINT), REGULAR AND LONG LENGTH, 1/2 in. DRIVE**

Nominal Opening, in.	Overall Length, in.		Outside Diameter, in.				Nut Opening Depth, A in., Min.	Bolt Clearance Hole Diameter, E in., Min.	Depth of Bolt Clearance Hole, in., Min.	Proof Torque, lbf-in., Min.
			Nut End, C		Drive End, D					
	Regular, Max.	Long, Min.								
			Min.	Max.	Min.	Max.				
7/16	3.000	3.500	0.600	0.814	0.865	1.063	0.203	0.281	1.250	850
1/2	3.000	3.500	0.681	0.891	0.865	1.063	0.209	0.344	1.250	1000
9/16	3.000	3.500	0.763	0.968	0.865	1.063	0.249	0.406	1.250	1350
5/8	3.000	3.500	0.844	1.046	0.865	1.063	0.281	0.469	1.250	1500
11/16	3.000	3.500	0.926	1.123	0.927	1.250	0.318	0.469	1.250	1750
3/4	3.000	3.500	1.001	1.260	0.927	1.250	0.356	0.531	1.250	1750
13/16	3.000	3.500	1.009	1.278	0.927	1.250	0.418	0.594	1.250	1750
7/8	3.000	3.500	1.178	1.355	0.927	1.250	0.479	0.594	1.250	1750
15/16	3.250	3.750	1.252	1.433	0.927	1.250	0.490	0.656	1.250	1750
1	3.250	3.750	1.333	1.510	0.927	1.250	0.490	0.656	1.250	1750
1 1/16	3.500	3.750	1.364	1.515	0.927	1.250	0.490	0.687	1.250	1750
1 1/8	3.500	3.750	1.439	1.590	0.927	1.250	0.632	0.781	1.250	1750
1 3/16	3.500	3.750	1.514	1.665	0.927	1.250	0.632	0.796	1.250	1750
1 1/4	3.500	3.750	1.588	1.740	0.927	1.250	0.632	0.812	1.250	1750
1 5/16	3.500	3.750	1.663	1.815	0.927	1.250	0.748	0.906	1.250	1750

**TABLE 16 TYPE IV, BAR, EXTENSION**

Drive Size, in.	Nominal Length, in.	Shank Diameter, in., Max.	Overall Length, in.		Proof Torque, lbf-in., Min.
			Min.	Max.	
1/4	2	0.380	1.750	2.500	500
	4	0.380	3.750	4.500	500
	6	0.380	5.750	6.500	500
3/8	3	0.510	2.500	3.500	1200
	6	0.510	5.500	6.500	1200
	12	0.510	11.500	12.500	1200
1/2	3	0.700	2.500	3.500	3500
	5	0.700	4.500	6.000	3500
	6	0.700	5.500	6.500	3500
3/4	10	0.700	9.500	10.500	3500
	3	1.313	2.500	3.500	9000
	7	1.313	6.500	7.500	9000
1	10	1.313	9.500	10.500	9000
	13	1.313	12.500	13.500	9000
1	3	1.563	2.500	3.500	15,000
	7	1.563	5.500	7.500	15,000
	13	1.563	11.500	13.500	15,000

**TABLE 17 TYPE V, ADAPTORS**

External Drive Size, in., Nominal	Internal Drive Size, in., Nominal	Overall Length, in., Max.	Outside Diameter, in., Max.
1/2	3/8	1.563	1.063
3/8	1/2	1.625	1.188
5/8	1/2	1.813	1.375
1/2	5/8	1.906	1.375
3/4	5/8	2.031	1.563
5/8	3/4	2.270	1.688
1	3/4	2.688	2.063
3/4	1	3.060	2.250

**TABLE 18 TYPE VI, UNIVERSAL JOINT**

External and Internal Drive End Size, in., Nominal	Overall Length, in., Max.	Diameter, in., Max.
1/4	1.688	0.625
3/8	2.500	1.000
1/2	3.063	1.375
5/8	3.500	1.500
3/4	4.250	1.750
1	6.100	2.375



**TABLE 19 HEXAGON MANDREL DIMENSIONS AND MAXIMUM DEPTH OF MANDREL INSERTION**

Size Across Flats, in.	Hexagonal Mandrel Dimensions, in.		Across Corners, Min.	Maximum Depth of Mandrel Insert, in.
	Across Flats Tolerances			
	(+)	(-)		
5/32	0.001	0.002	0.1745	0.069
3/16	0.001	0.002	0.2095	0.083
7/32	0.001	0.002	0.2440	0.096
1/4	0.001	0.002	0.2780	0.110
9/32	0.001	0.002	0.3133	0.133
5/16	0.001	0.002	0.3495	0.141
11/32	0.001	0.002	0.3880	0.156
3/8	0.001	0.002	0.4225	0.156
7/16	0.001	0.002	0.4935	0.198
1/2	0.001	0.002	0.5635	0.239
9/16	0.001	0.003	0.6339	0.265
5/8	0.001	0.003	0.7055	0.291
11/16	0.001	0.003	0.7769	0.317
3/4	0.001	0.003	0.8485	0.344
13/16	0.001	0.003	0.9201	0.370
7/8	0.001	0.003	0.9917	0.396
15/16	0.001	0.003	1.0631	0.422
1	0.001	0.003	1.1297	0.479
1 1/16	0.001	0.003	1.2013	0.505
1 1/8	0.001	0.003	1.2728	0.531
1 3/16	0.001	0.003	1.3443	0.557
1 1/4	0.001	0.003	1.4160	0.583
1 5/16	0.001	0.003	1.4870	0.609
1 3/8	0.001	0.003	1.5590	0.635
1 7/16	0.001	0.003	1.6310	0.661
1 1/2	0.001	0.003	1.7020	0.687
1 9/16	0.001	0.007	1.7700	0.713
1 5/8	0.001	0.007	1.8410	0.739
1 11/16	0.001	0.007	1.9120	0.765
1 3/4	0.001	0.007	1.9830	0.791
1 13/16	0.001	0.007	2.0540	0.817
1 7/8	0.001	0.007	2.1240	0.873
2 1/8	0.001	0.007	2.4080	1.010
2 3/16	0.001	0.007	2.4790	1.036
2 1/4	0.001	0.007	2.5490	1.063
2 5/16	0.001	0.007	2.6210	1.089
2 3/8	0.001	0.007	2.6910	1.115
2 7/16	0.001	0.007	2.7620	1.141
2 1/2	0.001	0.007	2.8330	1.167
2 9/16	0.001	0.007	2.9030	1.193
2 5/8	0.001	0.007	2.9740	1.219
2 3/4	0.001	0.007	3.1160	1.271
2 13/16	0.001	0.008	3.1870	1.297
2 15/16	0.001	0.008	3.3280	1.349
3	0.001	0.008	3.399	1.375
3 1/8	0.001	0.008	3.541	1.427

**TABLE 19 HEXAGON MANDREL DIMENSIONS AND MAXIMUM DEPTH  
OF MANDREL INSERTION (CONT'D)**

Size Across Flats, in.	Hexagonal Mandrel Dimensions, in.		Across Corners, Min.	Maximum Depth of Mandrel Insert, in.
	Across Flats Tolerances			
	(+)	(-)		
3 <sup>1</sup> / <sub>4</sub>	0.001	0.008	3.682	1.479
3 <sup>3</sup> / <sub>8</sub>	0.001	0.008	3.824	1.531
3 <sup>1</sup> / <sub>2</sub>	0.001	0.008	3.966	1.583
3 <sup>3</sup> / <sub>4</sub>	0.001	0.008	4.249	1.688
3 <sup>7</sup> / <sub>8</sub>	0.001	0.008	4.391	1.740
4	0.001	0.010	4.532	1.855
4 <sup>1</sup> / <sub>8</sub>	0.001	0.010	4.674	1.907
4 <sup>1</sup> / <sub>4</sub>	0.001	0.010	4.816	1.959
4 <sup>1</sup> / <sub>2</sub>	0.001	0.010	5.099	2.063

**TABLE 20 SQUARE MANDREL DIMENSIONS**

Size Across Flats, in.	Square Mandrel Dimensions, in.		Across Corners, Min.	Maximum Depth of Mandrel Insertion, in.
	Across Flats Tolerances			
	(+)	(-)		
3/16	0.001	0.003	0.2570	0.093
7/32	0.001	0.003	0.3006	0.109
1/4	0.001	0.003	0.3436	0.125
5/16	0.001	0.003	0.4294	0.140
3/8	0.001	0.003	0.5153	0.156
7/16	0.001	0.003	0.6012	0.218
1/2	0.001	0.003	0.6870	0.265
9/16	0.001	0.003	0.7730	0.328
5/8	0.001	0.003	0.8690	0.375
11/16	0.001	0.003	0.9450	0.375
3/4	0.001	0.003	1.0310	0.437
13/16	0.001	0.003	1.1170	0.453
7/8	0.001	0.003	1.2020	0.500
15/16	0.001	0.003	1.2880	0.546
1	0.001	0.003	1.3740	0.546

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